

539,623

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 July 2004 (22.07.2004)

PCT

(10) International Publication Number
WO 2004/061490 A1

(51) International Patent Classification⁷: **G02B 5/28,**
H01L 31/0216

(21) International Application Number:
PCT/EP2003/051068

(22) International Filing Date:
18 December 2003 (18.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0229597.0 19 December 2002 (19.12.2002) GB

Surrey KT15 2NX (GB). **RUSSELL, John** [GB/GB];
THALES PLC, 2 Dashwood Lang Road, The Bourne
Business Park, Addlestone, Near Weybridge, Surrey KT15
2NX (GB). **JONES, Glenn Morgan** [GB/GB]; THALES
PLC, 2 Dashwood Lang Road, The Bourne Business Park,
Addlestone, Near Weybridge, Surrey KT15 2NX (GB).

(74) Agent: **BROCHARD, Pascale**; THALES, 31-33, avenue
Aristide Briand, F-94117 ARCUEIL Cedex (FR).

(81) Designated States (*national*): JP, US.

(84) Designated States (*regional*): European patent (AT, BE,
BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

(71) Applicant (*for all designated States except US*): **THALES
PLC** [GB/GB]; 2 Dashwood Lang Road, The Bourne Busi-
ness Park, Addlestone, Near Weybridge, Surrey KT15 2NX
(GB).

Published:

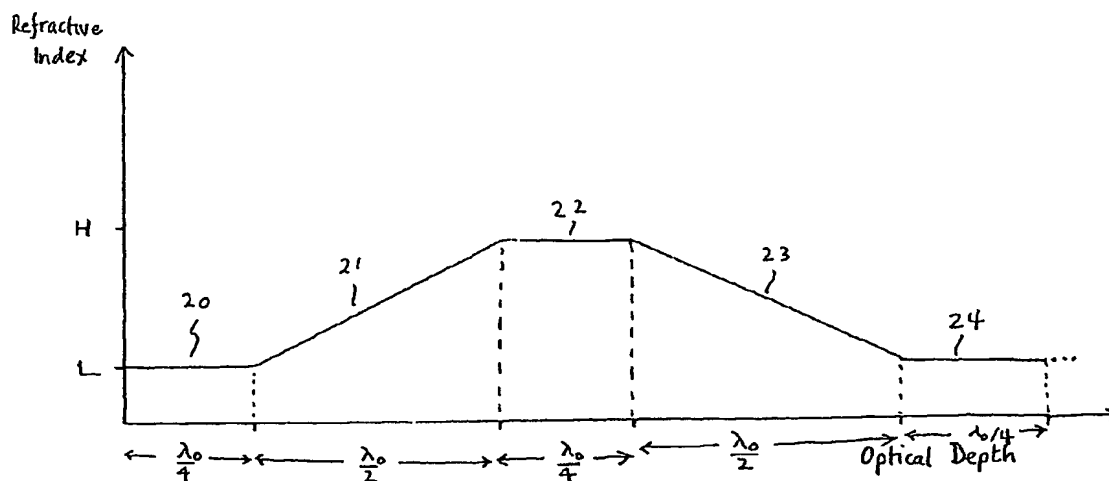
- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **WERNHAM,
Denny** [GB/GB]; THALES PLC, 2 Dashwood Lang Road,
The Bourne Business Park, Addlestone, Near Weybridge,

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: AN OPTICAL FILTER



(57) Abstract: An optical filter including a substrate having a plurality of layers of materials stacked upon it, each of which materials is formed from one or both of : a first material having a first index of refraction; and a second material having a second index of refraction being less than the first index of refraction; wherein the plurality of layers of materials include a first layer and a second layer each formed from an inhomogeneous mixture of said first material and said second material; and a third layer formed from the first material being stacked in between the first layer and the second layer; wherein the optical thickness of the first and the second layer is $2Q$, and the optical thickness of the third layer is Q , where Q is the thickness of a given said layer traversed by one quarter of a common reference wavelength, and wherein all variations in the index of refraction of the first and second layer increase that index of refraction as the depth of the respective layer increases from regions thereof remote from said third layer to regions thereof proximate the third layer.

WO 2004/061490 A1